FINAL
2004 Listing & Delisting Criteria for Hawaii State Surface Waters
Compiled under Clean Water Act §303(d)
October 1, 2003

Section 303(d) of the federal Clean Water Act requires states to list impaired waters every two years after reviewing "all existing and readily available water quality-related data and information" from a broad set of data sources and to submit this list to the U.S. Environmental Protection Agency (EPA). If previously listed waters are not listed on the subsequent list, "good cause" must be demonstrated on the basis of availability of newer and/or more accurate water quality data, discovery of past analytical flaws, or changes in conditions such as closing of a discharge pipe or implementation of major nonpoint source pollution controls.[1]

For the 2004 List, the Hawaii State Department of Health (HIDOH) will screen available data according to listing criteria, below, that allow sorting of surface water quality data into one of three priority rankings for decision-making. Data evaluated at the end of the current listing cycle shall have been collected within the six-year period prior to each EPA-required submittal deadline. A six-year window was chosen to ensure that data reviewed for each listing cycle are both recent and available in sufficient quantity to warrant a statewide water quality data review. In the process of generating this list, the State is assuming that waterbodies meet water quality standards unless a weight-of-evidence approach shows otherwise.

The format of Hawaii's Water Quality Standards[2] differs from other states' standards in that many of the criteria are expressed as geometric means of a representative data set, and are not intended for comparison with single sample values. The criteria contain allowances for rainfall events in the form of less strict "10 per cent" and "2 per cent" criteria. Because funding is limited for monitoring waterbodies in Hawaii, we use minimum sample size requirements to ensure a reasonable level of sampling of a waterbody over time and space. These sample sizes are not strict cutoffs, rather they are guides meant to systematize decision-making by the Department of Health in protection of environmental health and public health.

Data Sources:

Data from the following sources may be used for making listing or delisting decisions in addition to or instead of routine HIDOH Clean Water Branch sampling, provided that an acceptable written Quality Assurance/Quality Control (QA/QC) Plan or other documented data quality assurance process was utilized during sample collection and analysis and is available for review, if requested:

1) United States Geological Survey (USGS)
2) National Oceanic & Atmospheric Administration (NOAA)
3) Universities
4) Community groups, individuals & respondents to a published, statewide "Call for Data"
5) HIDOH Hazard Evaluation and Emergency Response Office (HEER)
6) Military
7) United States Fish and Wildlife (USFWS)
8) Superfund investigation and remediation projects
9) United States Department of Agriculture (USDA)

[1] Federal regulations concerning the listing process can be found at 40 CFR Part 130.7.
[2] State Water Quality Standards can be found at HAR 11-54.

10) Special projects by HIDOH Clean Water Branch
11) Other government agencies
12) Environmental Assessments and Environmental Impact Statements
13) Consulting Firms
14) Private & public entities operating under water pollution control permits

Basic Data Quality Requirements for All Listing Priorities:

Acceptable written QA/QC documentation appropriate for the project, and containing descriptions of procedures used during sample collection and analysis, must be available for review, if requested.

Additional Data Quality Requirements for Listing Priority 1:

1. Photographs and written descriptions of the sampling sites are available upon request.
2. A general visual assessment of the water body that contains sufficient information to place the water body in the context of surrounding land uses and overall condition of the habitat is also available upon request.

Listing Priority 1:

Waters will be listed if these criteria are met for conventional pollutants such as total suspended solids, nutrients and temperature and toxic substances compiled in the Hawaii Administrative Rule, Chapter 11-54, Water Quality Standards:

1. For conventional pollutants, at least ten (10) samples per water body were collected and analyzed, the geometric mean[3] of the data for a single waterbody exceeds the corresponding geomean criterion and at least one of the following requirements is met:
    a. For streams, there must be at least two stations per stream (upper and lower) and at least five (5) samples per station.
    b. For non-flowing fresh water bodies such as ponds and reservoirs, and for tidally-influenced water bodies such as estuaries and coastal waters, the samples must be distributed either on transects or randomly over the extent of the water body or section of water body sampled. In order to obtain a representative sample for evaluating water quality over the area of concern, not only at a single point, samples should be collected along onshore-offshore transects extending seaward at least 50 feet, or at randomly scattered points across the surface of the area of concern.

[3] The concept of a geometric mean may seem confusing: the nth root of the product of n numbers. However, people use an "arithmetic" mean in every day life for averaging. Unlike an "arithmetic" mean, a "geometric" mean or "geomean" multiplies numbers rather than adding them to find an average. This method allows people to use geometric means when they have highly variable number sets and do not want a few high or low values to distort an average.

2. In order to independently evaluate the "10% of the time" and "2% of the time" numeric criteria, sample sizes for the 10% criteria must be 100, for the 2% criteria must be 500. For listing, calculations using these data sets must exceed the corresponding criteria.
3. For toxic substances, at least three samples per water body were collected and analyzed, and the sample geometric mean exceeded the corresponding numeric criterion listed in §11-54-04(a).

Listing Priority 2:

Waters may be listed if all data requirements under Listing Priority 1 are not met, provided that at least one of the following factors is met and sufficient site documentation is available:

1. For Conventional Pollutants,
    a. At least ten (10) samples per water body were collected and analyzed, but wet and dry season data must be combined because insufficient sample sizes exist to evaluate the wet and dry standards separately (Note: if the geometric mean of this data only exceeds the dry season standard, a majority of the dry season sample values must exceed the dry season standard to warrant listing; however, if the geometric mean of this data exceeds both the wet and dry season standards, the waterbody may be listed for both wet and dry exceedances),
    b. The majority of sample values in a data set of 5 - 9 values for a single waterbody exceed the corresponding geometric mean criterion in the rule by a factor of 2 or more,
    c. Calculations with a sample size of 50 to 90 show exceedance of the corresponding "10% of the time" criterion or
    d. Calculations with a sample size of 250 to 450 show exceedance of the corresponding "2% of the time" criterion.
2. The type of water quality problem identified is particularly severe (i.e., each of two measurements of a toxic substance is more than twice the corresponding water quality criterion).
3. For narrative information, at least three sampling events are presented, direct correlations to the narrative criteria in 11-54-04 can be established and the narrative standards are not attained. Data sets for evaluation of narrative criteria must include at least 3 sampling events and represent conditions in both the wet and dry seasons. These narrative criteria may be evaluated using HIDOH approved habitat or biological assessments as long as they can be directly correlated to specific narrative criteria in HAR 11-54-04.
4. For toxic substances, at least three samples per water body for toxic substances were collected and analyzed; compute the sample geometric mean and compare to the narrative criteria listed in §11-54-04(a). Acute toxicity standards for sediment may be evaluated using broadly accepted standards such as those developed in Canada and New York, provided that HIDOH deems them appropriate for use in the Hawaiian environment.

Listing Priority 3:

These waters are considered a high priority for additional monitoring; data will be assessed at the end of the next listing cycle and a listing decision made at that time:

1. ≤ 5 sample values are available for conventional pollutants.
2. <3 sampling events for determination of toxic or narrative standard exceedances.
3. Other information is limited and inconclusive.

The Department of Health reserves the right to list waters within any priority category when dilution calculations, predictive modeling, historical data or other supporting information indicate probable exceedance of the water quality standards and/or a risk to public and environmental health. These determinations will be made based on a weight of evidence approach with input from the U.S. Environmental Protection Agency.

Delisting Criteria:

Waters may be delisted if the data show that water quality standards are attained, and the appropriate sample sizes and other information required under Listing Priority 1 are available.